# CS144
# An Introduction to Computer Networks

## What the Internet is

*The TCP Service Model*


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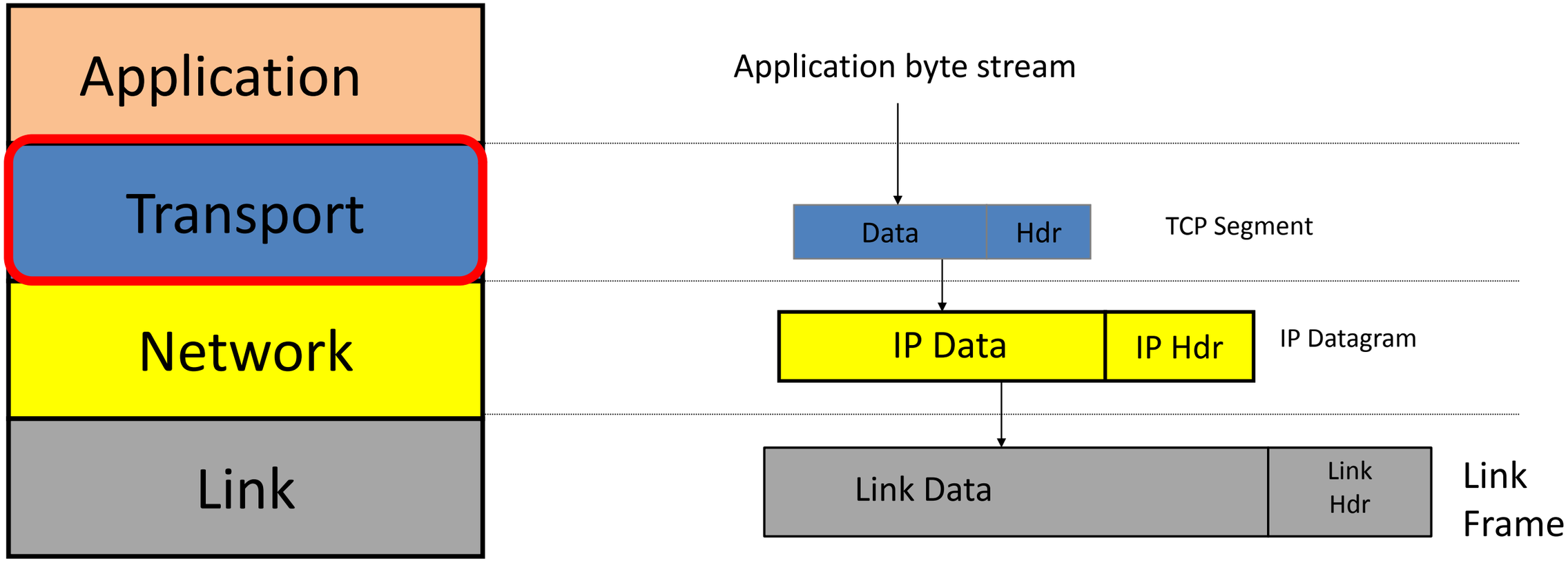
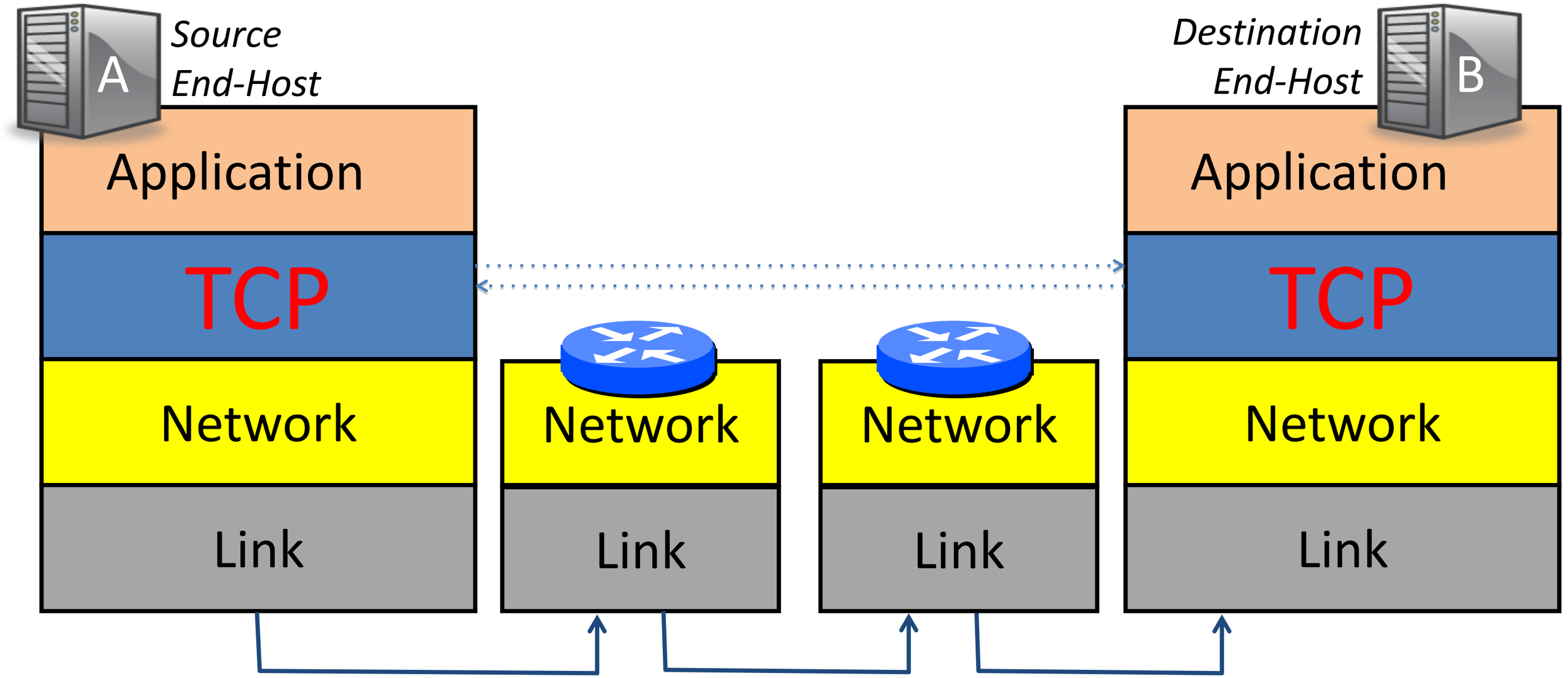
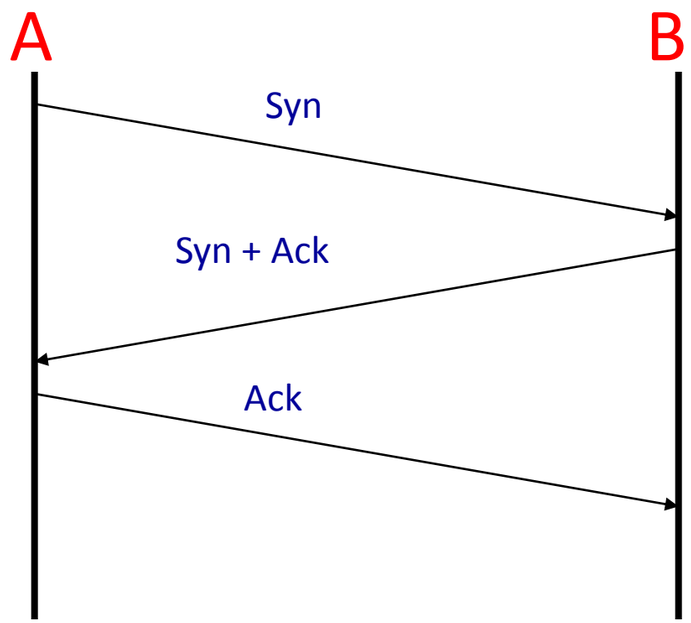
# Transmission Control Protocol (TCP)



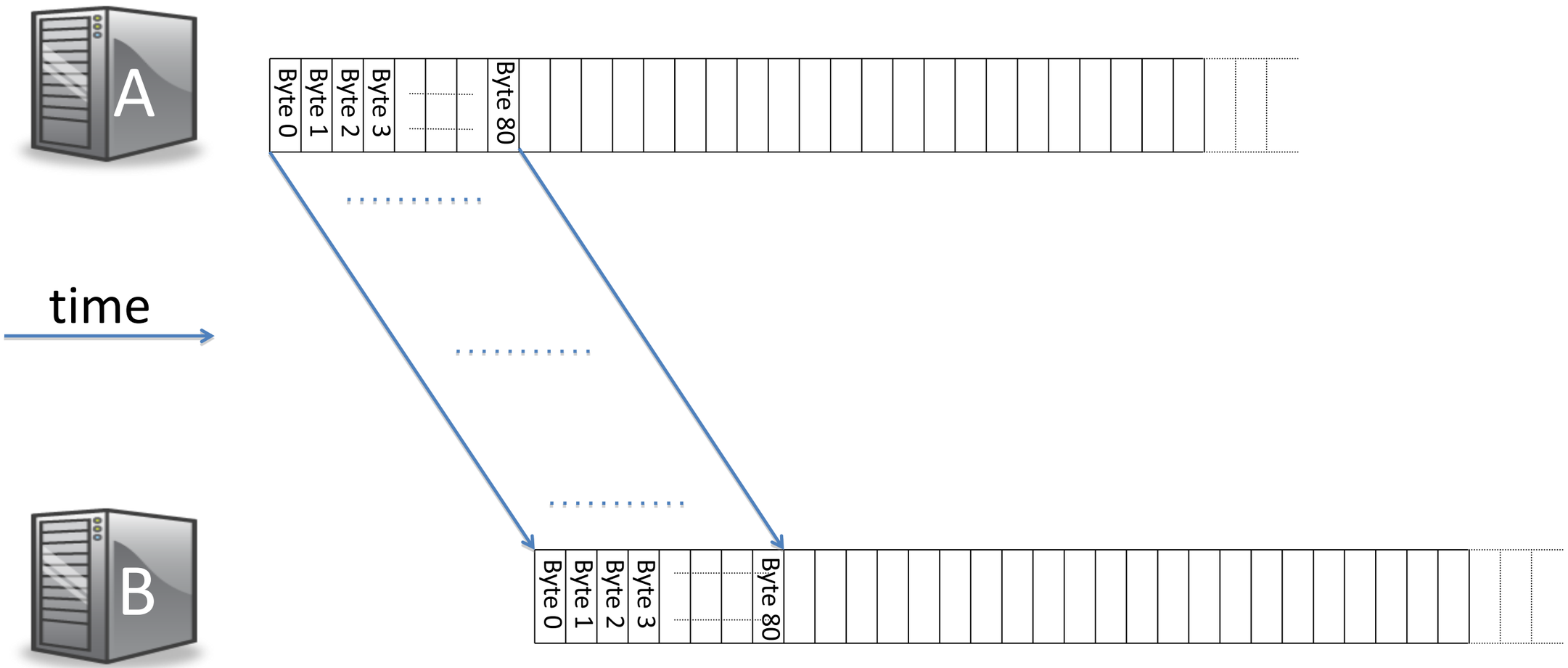
# Peer TCP layers communicate



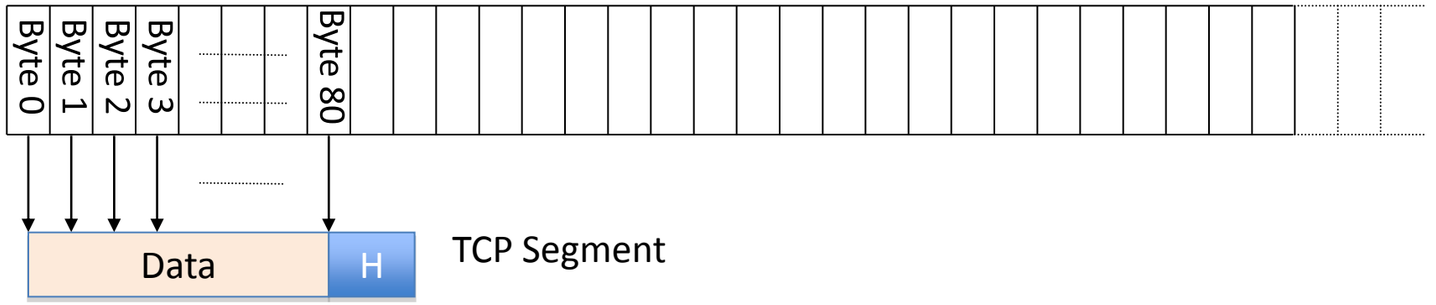
# Connection setup
# *3-way handshake*



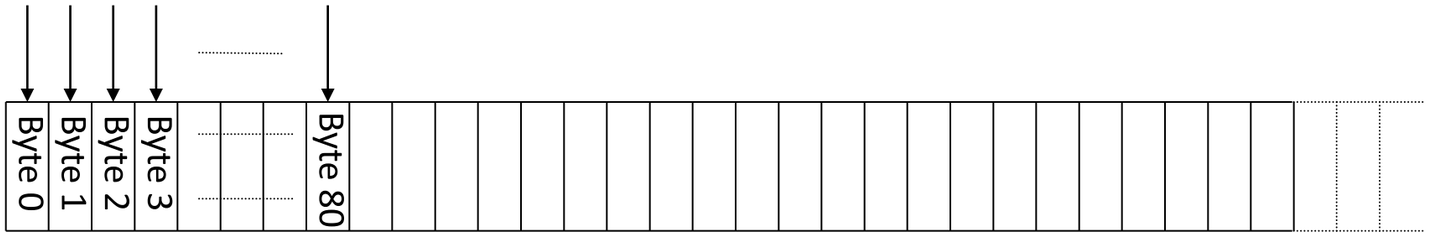
# TCP “stream of bytes” service



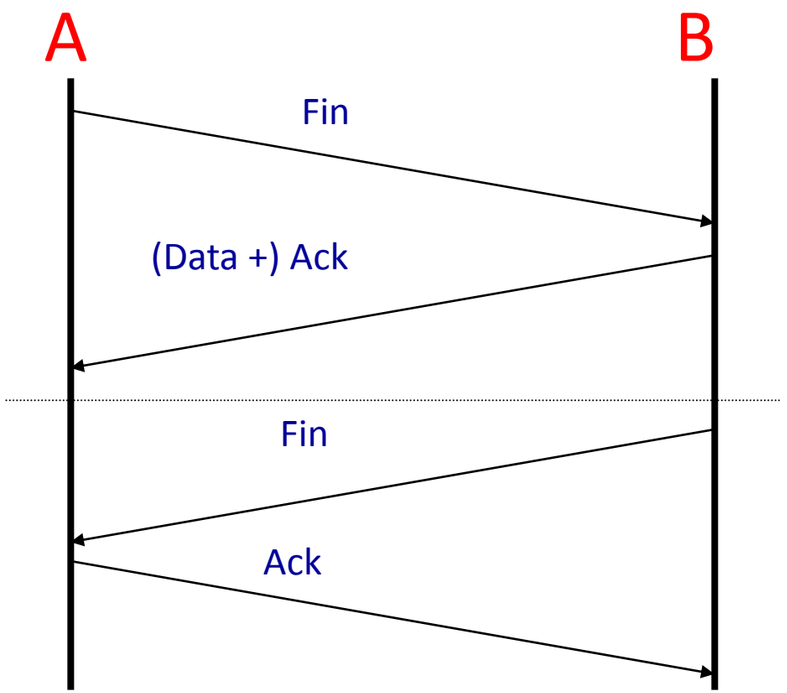
# …emulated using TCP “segments”





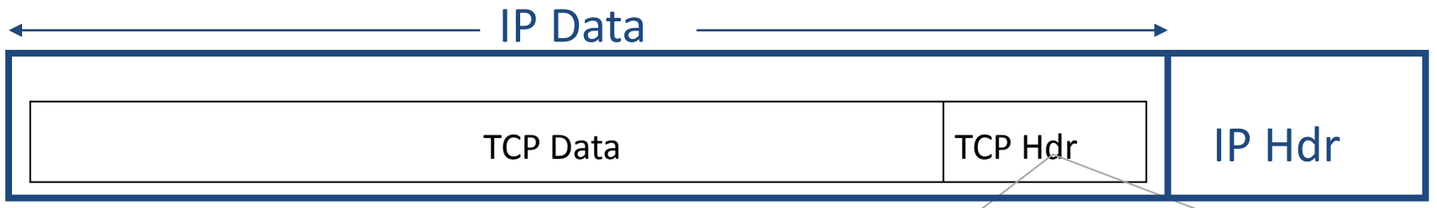
# Connection teardown

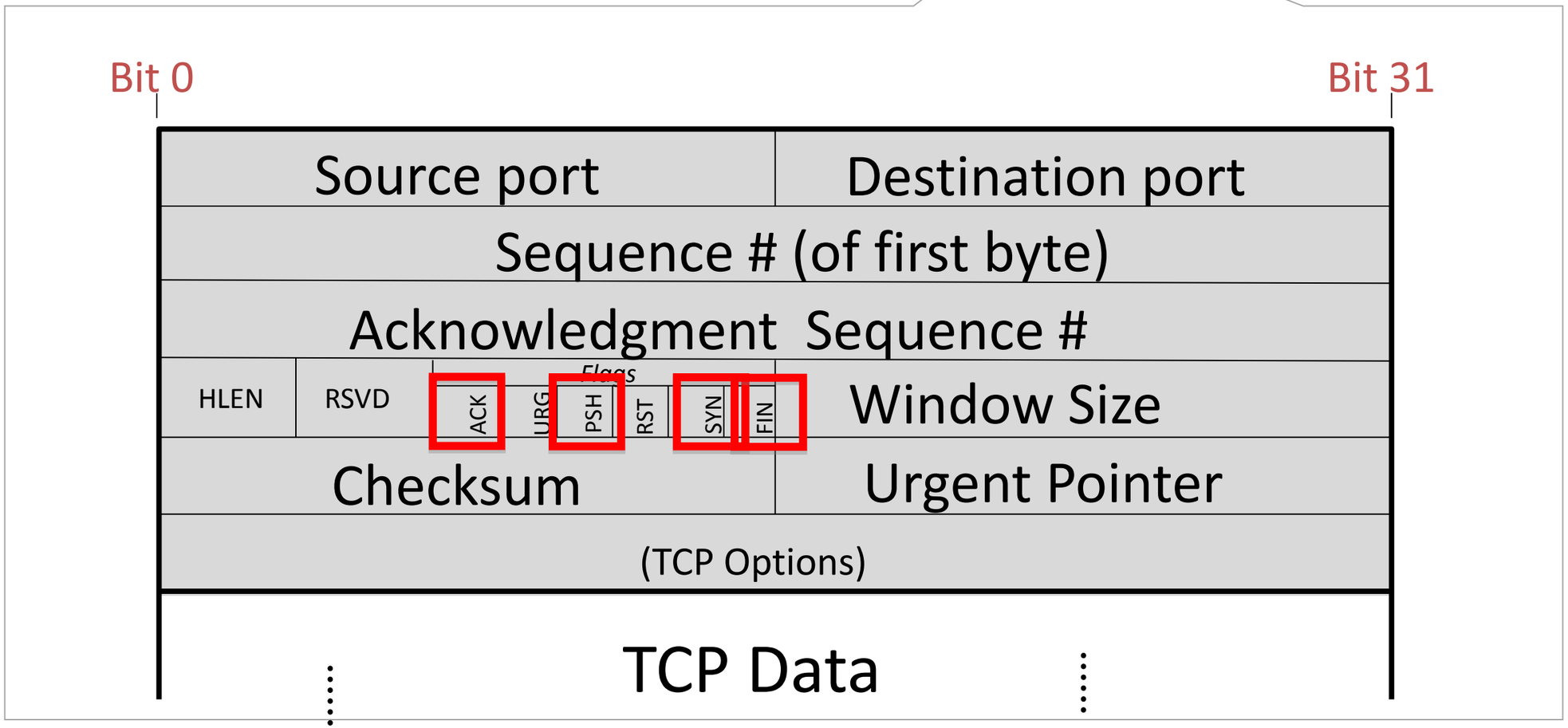


# The TCP Service Model

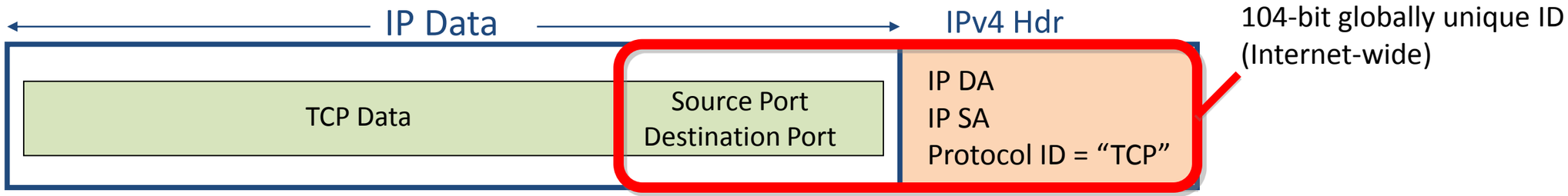
| Property | Behavior |
|---|---|
| ***Stream of bytes*** | Reliable byte delivery service. |
| ***Reliable delivery*** | 1. Acknowledgments indicate correct delivery.<br>2. Checksums detect corrupted data.<br>3. Sequence numbers detect missing data.<br>4. Flow-control prevents overrunning receiver. |
| ***In-sequence*** | Data delivered to application in sequence transmitted. |
| ***(Congestion Control*** | Controls network congestion.) |

# The TCP Segment Format



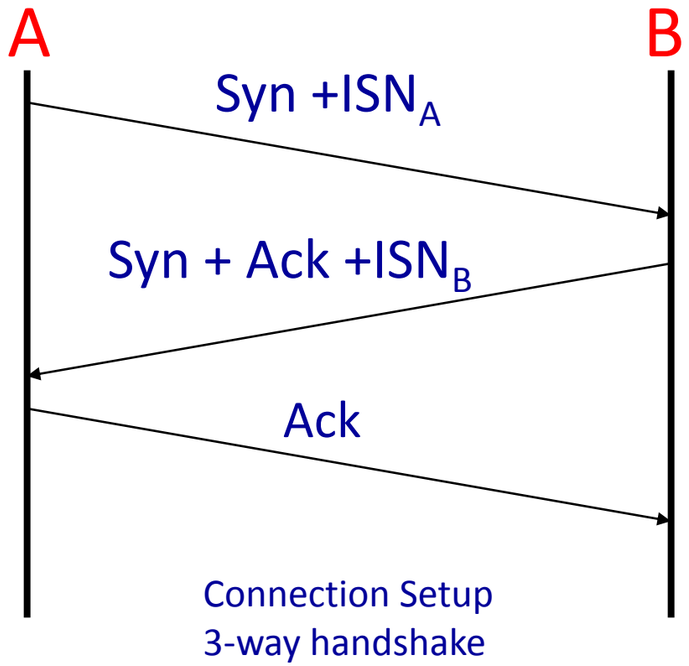



# The Unique ID of a TCP connection

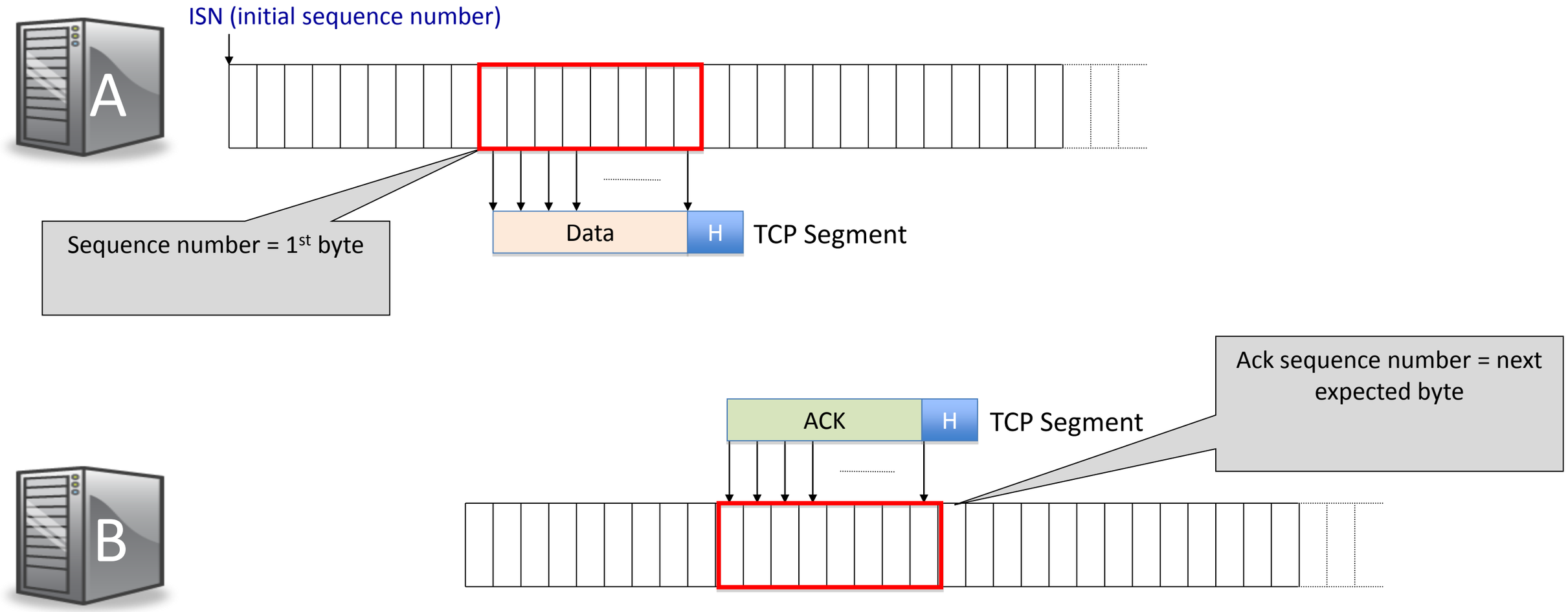



1. Host A increments source port for every new connection

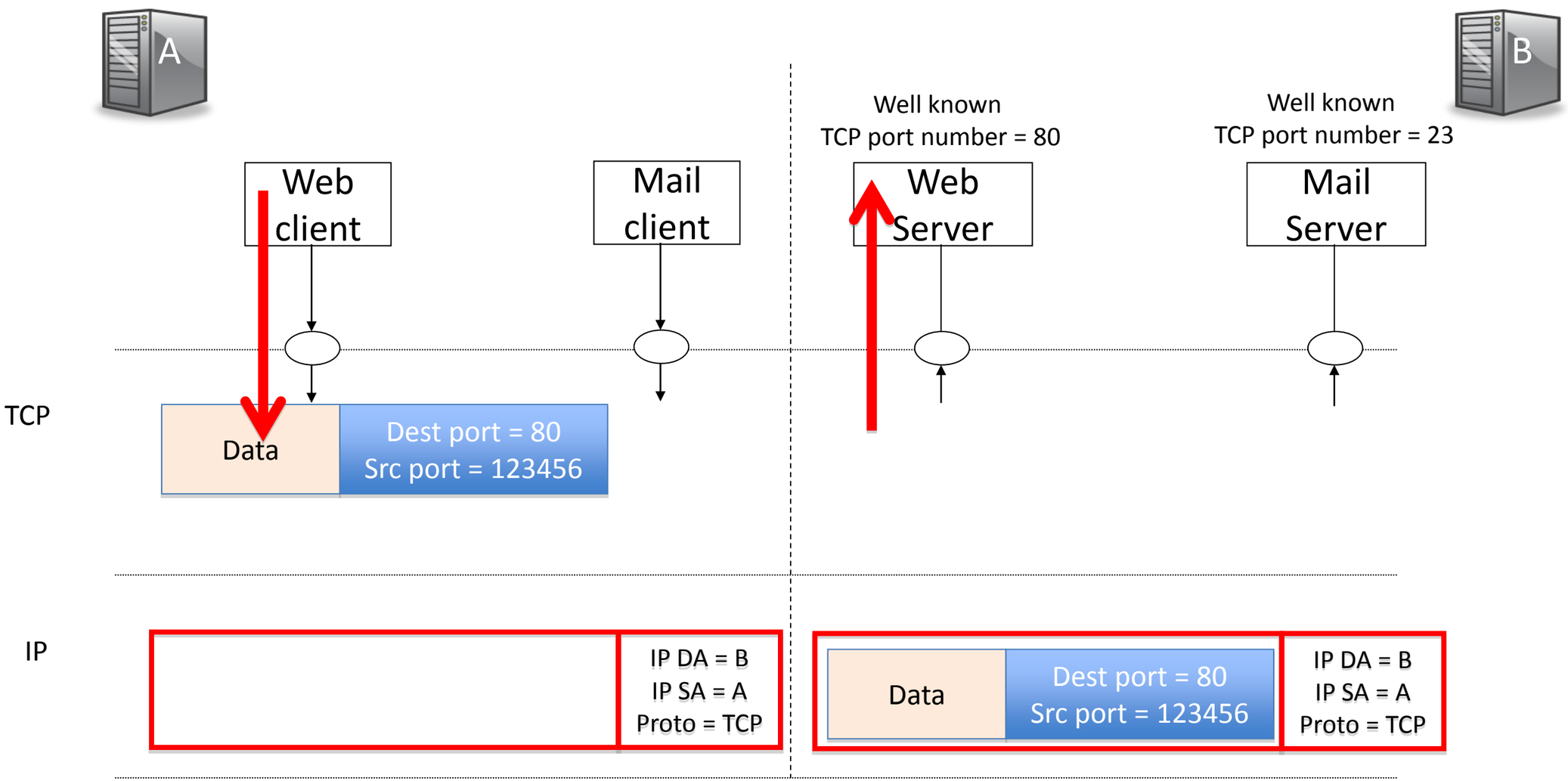
2. TCP picks ISN to avoid overlap with previous connection with same ID.



# Sequence Numbers



# TCP: Port Demultiplexing



# TCP Sliding Window

You will learn about other TCP features in upcoming videos:

- Window-based flow control
- Retransmission and timeouts
- Congestion control

# Summary

TCP provides in-order, reliable delivery of a stream of bytes between application processes.

# <The End>